CHARGE NUMBER: 6902

PROGRAM TITLE: BIOCHEMICAL SPECIAL INVESTIGATIONS

PROJECT LEADER: A. H. WARFIELD

PERIOD COVERED: OCTOBER 1 - 31, 1985

DATE OF REPORT: NOVEMBER 4, 1985

I. CURING STUDIES

A. BURLEY TOBACCO (1): The burley (KY-14) tobacco will be fully cured within the next two weeks. Weekly samples have been taken from three stalk positions, and analyses are still in progress for nitrate, nitrite, nicotine, minor alkaloids, and TSNA. In addition, nitrate reductase activity (NRA) is being determined. The acquisition of analytical data should be essentially completed by the end of November. As previously reported, the objectives of this study are 1) to obtain a time-course of the fate during air-curing of nitrate and alkaloids, accumulation of TSNAs, and NRA; and 2) to determine the effects of ascorbate, tocophorol, and their esters on TSNA formation during curing. After 6 weeks of curing, no NRA has been detected, although a small amount of TSNA formation has occurred, especially in the lower stalk positions. Nitrate values are generally much lower than normal for burley.

B. V-446 TOBACCO (2): Greenhouse-grown V-446 tobacco, a nornicotine converter strain, is also being air-cured on the same schedule as in the burley study. Due to the limited amount of tobacco, the sampling has been less frequent in this case. There is evidence for considerable conversion of nicotine to nornicotine during curing thus far. This study will also be completed in the next week. The objective here is to determine whether nornicotine conversion results in the formation of greatly increased levels of NNN. Although nitrate levels are low here also, NNN appears to be the major TSNA formed. The amount is very dependant on leaf position, with the highest amount occurring in the lower part of the plant. More detail will be available after the final samples are obtained. As in the burley study, no NRA has been detected.

II. ORGANIC NITROSATING AGENTS (3)

An experiment was initiated this month to determine whether there is a possibility that organic nitrosating agents can form from constituents of the chloroform soluble portion of tobacco leaf. Burley and bright chloroform extracts have been obtained, and are being allowed to react with nitrite under various conditions. The "nitrosated" extracts will then be used to treat an amine, and the final mixtures will be analyzed for the corresponding nitrosamine. Depending on the results of the initial phase of this study, further attempts may be made to locate similar nitrosating agents formed naturally during curing.

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III. REFERENCES

1. Warfield, A. H. Notebook No. 8196; Petri, D. Notebook No. 8006; Hansen, K., Notebook No. 8215; Yu, T. Notebook No. 8149. Contributions to this study have been made by all members of 6902, as well as several members of 6908 and 1901.

2. Warfield, A. H. Notebook No. 8196; Petri, D. Notebook No. 8006; Hansen, K. Notebook No. 8215; Yu, T. Notebook No. 8149.

3. Warfield, A. H., Notebook No. 8196.

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